

OF

CRAIG H. BAKER, CLYDE T. CARTER, ALEX S. FATER, URS F. NAGER,

CHRISTOPHER PALAGI, CHRISTINE SVELNIS AND MARK A. WOJOICKI

CHRISTOPHER PALAGI, CHRISTINE SVELNIS AND MARK A. WOJOICKI

FOR

# LOW INSERTION FORCE ELECTRICAL SOCKET CONTACT

## BACKGROUND OF THE INVENTION

The present invention relates to electrical contacts in general, and more particularly to an electrical female socket contact that mates with a male pin contact to provide a sacrificial make-first/break-last contact arrangement for use in a "hot pluggable" electrical contact configuration.

There is a need for electrical contacts that can be connected and disconnected under an electrical load i.e., "hot pluggable" and at the same time have the capability of accommodating axial misalignment of pin and socket electrical contacts. Furthermore, the socket contact should be able to provide arc receiving "sacrificial" portions to maintain electrical integrity of the fully mated pin and socket contacts while at the same time being able to mate with a low insertion force.

It is accordingly a general object of the invention to fulfill this need.

## BRIEF DESCRIPTION OF THE INVENTION

A low insertion force electrical socket contact employs a plurality of inwardly extending projections that function as arc receiving elements upon the initial mating of the socket contact with a corresponding male pin contact. The distance between the inwardly extending arc receiving elements measured across the socket contact bore is greater than the maximum transverse

distance of the male pin contact. Further insertion mating of the male pin contact establishes electrical contact with a plurality of integrally formed spring contacts in the socket contact.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is an isometric view of the socket contact of the present invention;

Figure 2 is a side elevation of the socket contact of Figure 1;

Figure 3 is an end view of the socket contact of Figure 2;

Figure 4 is a plan view of the socket of Figure 2; and,

Figure 5 is a view in cross-section taken along line A-A of Figure 2.

#### DETAILED DESCRIPTION

Turning now to the drawings, and particularly to Figure 1, there is shown an electrical socket contact indicated generally by the reference numeral 10. The socket contact 10 preferably is stamped and rolled into the configuration shown in Figure 1 from a single sheet of material. The socket contact 10 has at least two inwardly projecting arc receiving elements 12 (one of which is shown in split form as 12a and 12b in Figure 1 because of the preferred stamped and rolled socket contact embodiment). It should be noted that the inwardly extending arc receiving elements 12 can take the form of an inwardly extending stamped "dimple" as shown in Figures 2, 4 and 5. The arc receiving elements 12 typically establish an initial electrical contact

with a corresponding male pin contact (not shown and depending upon mis-alignment of the male pin contact with the socket contact 10) and a subsequent last contact upon mating withdrawal ("make first/break-last"). The arc receiving elements 12 are spaced apart across the bore axis of the socket contact at a maximum distance that is greater than the maximum transverse distance of the male pin contact. This spacial configuration permits the initial contact mating of the arc receiving elements 12 to function as "sacrificial" elements while the fully mated male/female electrical contact is established by a plurality of integrally formed spring contacts 14 which thus maintain their electrical and physical integrity. It should be noted that the forward portions 14a of the spring contacts 14 cooperate with arc receiving elements 12, and the forward end 13 of the socket barrel itself to provide a "triple" arc receiving entrance for the male pin contact(not shown). Assuming enough axial mis-alignment, this would take place sequentially,as the socket contact ring 13, the arc receiving projections 12 and the forward end of the cantilevered beams 14 (see Figures 2-5)

Preferably, the socket contact 10 has an opening 16 to its bore that provides a "solder pot" for soldering an electrical cable (not shown) to the contact. In addition to providing a "solder pot", the opening 16 also furnishes a gas pressure relief during the solder operation. It will be appreciated that if the socket contact 10 is used as a "crimp" contact for an electrical cable, opening 16 limits the travel distance of crimp deformation.

In addition to the optional "solder pot" opening 16, the socket contact 10 has an optional spring housing latch 18 for removable insertion into a contact housing (not shown) in a conventional manner.

Having described in detail a preferred embodiment of our invention, it will be apparent to those in the art that numerous modifications can be made therein without departing from the scope of the invention as defined in the following claims.

What we claim is:

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